

THE CONDITIONS GOVERNING BIRD LIFE IN
ARIZONA.

BY HERBERT BROWN.

THE conditions governing bird life in Arizona are not as elsewhere 'in the States.' This country is but thinly settled, the big towns, particularly, being few and far between. Outside of their immediate vicinity the shot gun practically disappears, and the country man and boy cut but small figure in the increase or decrease of birds. The general aridity of the country is such that vast tracts of land must, perforce, remain forever uninhabited. Cattle interests are, however, a dominant feature in the development of the country, and to these, more than all else combined, must be charged the obliteration of bird life in the so-called desert portions of the Territory.

The stock business at one time promised enormous profits and because of this the country was literally grazed to death. During the years 1892 and 1893 Arizona suffered an almost continuous drouth, and cattle died by the tens of thousands. From 50 to 90 per cent of every herd lay dead on the ranges. The hot sun, dry winds and famishing brutes were fatal as fire to nearly all forms of vegetable life. Even the cactus, although girdled by its millions of spines, was broken down and eaten by cattle in their mad frenzy for food. This destruction of desert herbage drove out or killed off many forms of animal life hitherto common to the great plains and mesa lands of the Territory. Cattle climbed to the tops of the highest mountains and denuded them of every living thing within reach. Often many miles from water and too weak to reach it they perished miserably. I saw, later, what I had never expected to see in Arizona, Mexicans gathering bones on the ranges and shipping them to California for fertilizing purposes. I have thus particularized, for in these dry bones can be read the passing of the Partridge from many a broad mile of the Territory, in fact they practically disappeared from four fifths of the country. When food and protection were abundant these birds were plentiful from the Colorado to the Rio Grande. On the plains and in

the valleys Gambel's Partridges were evermore to be met with, while the Blue or Scaled were almost as common over much of the same country. The Massena, occupying the highest ranges, were, naturally, better protected and thus escaped the general doom. They were, however, never very numerous and soon became exceedingly rare, but when conditions again became favorable they seemed to recover from their losses more readily than did their congeners, and in a few years were again to be found in their old time numbers. Of the Masked Bob-white but little can be said. The few that were then known to exist dropped out of sight altogether and it was not till the spring of last year that I could learn of one being in the country. At that time two small bunches were reported to me, one on the upper Santa Cruz, the other, to my surprise, high up on the eastern slope of the Baboquivari Mountains. Heretofore I had never known them to range higher than the foothills.

Although the cattle industry is slowly recuperating from its great loss it will never again assume its former proportions, for the lessons thus taught will not soon be forgotten. The ranges were foolishly overstocked, and thus many owners of big herds were financially ruined by their covetousness, but under the most favorable circumstances it will be years before the life, once so common to the desert country, recovers from the shock. In the cultivated valleys, and country adjacent thereto, it is again on its feet, but the great reaches of desert are still tenantless. Subsequent to the big drouth I traveled several hundred miles across country and did not see a dozen Quail a day where formerly I had seen hundreds.

The Gambels are a hardy bird and under ordinary conditions multiply rapidly, and, although not susceptible of domestication, increase enormously in the cultivated districts. In 1889 and 1890 there was, so I was informed by the express agent, shipped out of the Salt River valley 3000 dozens. In 1887, I think, the first game law was introduced in the territorial legislature. The bill originated in the Tucson Gun Club, and its purpose was largely the protection of 'Quail,' but so great a pest were the birds regarded by the ranchmen in the Salt River valley that the legislators from Maricopa County threatened to kill the bill unless the

clause protecting 'Quail' was stricken out. They were therefore exempted from its provisions, but two years later the law was amended in their behalf. Under a misapprehension the word 'partridge' had been allowed to stand and prosecutions could have been had under it for the wanton destruction of these birds, but none were instituted as conviction would have been impossible.

The Mohawk valley, in Yuma county, is probably the most prolific breeding spot in the Territory. It was, at one time, a favorite place for trappers and pot-hunters, and it was not until the game law had been amended that their nefarious practices were broken up. In six weeks, in the fall of 1894, no less than 1300 dozens were shipped to San Francisco and other California markets. The price at first realized, so I was told by the shippers, was \$1.12½ per dozen, but later 60 cents only were realized. The Quail were trapped, their throats cut, then sacked and shipped by express. I was told by one of the parties so engaged that he and his partner caught 77 dozens in one day. They used eight traps and baited with barley. Their largest catch in one trap, at one time, was 11 dozens. At the meeting of the next legislature the game law was again amended and it was made a misdemeanor to trap, snare or ship Quail or Partridges from the Territory. This effectually stopped the merciless slaughter of the gamiest bird in Arizona — Gambel's Partridge.

Carolina, White-winged, Inca, and Mexican Ground Doves are all common to southern Arizona. After the drouth, before referred to, these birds increased to large numbers in the cultivated districts, more especially the two former. This was due to no actual increase in the number of birds, but to lack of food elsewhere. They were destroyed by gunners in and out of season. They were, however, included in the amended game law of 1897, and are now protected between the first day of March and the first day of June. Another month is, I think, necessary to see them through the breeding season. The next legislature will be asked to extend the closed season to the first of July.

In a country so widely uninhabited as this it is not possible to particularize much as to other birds, especially the migrants which come and go with each recurrent spring and fall. To many of

them Arizona is but a bridge to reach their breeding and winter grounds, hence they are met with here only as travelers to the north and south. Among the summer residents I cannot say there was any appreciable diminution, but it did noticeably change the nesting habits of several of the larger Thrashers. Heretofore they had chiefly made homes in the different forms of cacti, and when this was broken down and destroyed they occupied the next round on the vegetable ladder—mesquite and palo verde trees and bushes.

THE MOULT OF THE NORTH AMERICAN *TETRAONIDÆ* (QUAILS, PARTRIDGES AND GROUSE).

BY JONATHAN DWIGHT, JR., M. D.

I. Fundamental Principles of Moult and of Plumage.

IN SPITE of all that has been written regarding the plumages of the Grouse and their allies variously known as the Quails, Partridges, Pheasants and Ptarmigans, there still is room for further discussion of the relations that exist between their plumages and their moults, from which standpoint little has hitherto been attempted. From the comparative study of moult in other groups of birds, I am convinced that this is the proper point from which to view the subject in order to comprehend its full significance.

The fact that the plumage of any bird at a given time is simply one of a series following each other during the bird's natural life, is obvious when it is remembered that each new feather grows from the same papilla as the old one. Plumage, which is an assemblage of feathers, would be very simple to understand if all the papillæ were equally active at a period of moult, but as a matter of fact, individual papillæ, as well as whole groups of them, may remain dormant and thus produce the mixed plumages that have been so difficult to understand in many species of birds.